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NO DRAWINGS

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(54) IMPROVEMENTS IN OR RELATING TO ACIDULATED FOOD PRODUCTS

(71) I, WALTON JOHN SMITH, a citizen of the United States of America, residing at 171 Sharp Hill Road, Wilton, State of Connecticut, United States of America, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention pertains to foods with a low degree of cariogenicity. It pertains also to confections in which the flavor is normally supplemented with acidulants such as citric, tartaric, and other polybasic acids.

This invention has as one of its objectives to develop new confections and other foods which do not suffer from the tendency toward cariogenicity of confections containing both fermentable sugars and polybasic acidulants.

It is well known that glucose and other readily fermentable sugars are quickly converted to acids in the plaque on the dental enamel, resulting in damage to the enamel. It has also been demonstrated that acids present in foods also cause similar damage to the enamel.

Sour balls and other acidulated sugar-containing candies thus have a "double-barrelled" action in causing tooth decay—the acids already present in the candy as well as the acid formed in the fermentative process both contribute to the damage to the dental enamel.

I have been able to prepare candies without sugar and without acidulants that are not easily distinguished from their sugar-containing counterparts. Fruit-flavored candies benefit greatly in flavor by the addition of a small amount of acidulant.

An objective of this invention is to prepare fruit flavored candies and other foods with special acidulants which produce a satisfactory drop in pH with minimum buffering on the acid side. These candies should have little effect on the dental enamel because of the buffering capacity of the saliva and because there is little fermentative acid formed on the dental plaque.

In order to achieve this latter objective, it is necessary to use a monobasic acidulant which is a strong acid, or an acidulant in which each acid group is a strong acid. It is also useful to exclude from the formula any buffering ingredients such as di- or tribasic acids or their salts.

According to the present invention there is provided a non-buffered food product containing an acidulant in which said acidulant is betaine hydrochloride, hexamic acid or acid saccharin.

The two last acidulants may simultaneously supply the necessary sweetness for confections made with low-fermentable sugars, i.e. sugars having reduced fermentability compared to readily fermentable sugars such as glucose and also having reduced sweetness.

A comparison of various acidulants was made by adding known milliequivalents of each acid to a quart of water separately:

MEQ	Citric	Malic	Betaine HCl	Hexamic	Saccharin
0	8.67	8.65	8.48	8.28	8.80
0.25	4.78	4.59	3.68	3.72	4.12
1.0	3.26	3.57	2.83	2.81	2.92

[*Price 25p*]

The above represent pH value with 0, 0.25 and 1.0 milliequivalents of the acid shown. It can be seen from the above data that only one-fourth the milliequivalents of hexamic acid are required to obtain the same acidifying effect as is required for citric acid. This means that only one fourth the buffering by the saliva is required to neutralize the candy completely. Actually it is even more favorable because the pH need only be raised to about 5 to prevent damage to the enamel.

This invention has application to many types of confections, gelatin desserts, cookie fillings and soft drinks. Among the confections in which this invention may be applied are hard candies, gum drops and fruit-flavoured toffees.

Because hexamic acid is quite soluble in alcohol, it can be formulated into the flovour oils used in producing acidulated foods. The sodium salt is soluble in propylene glycol, hence flavour compounding for non-acid foods of for mixtures of cyclamate salts and hexamic acids may be made in propylene glycol. Saccharin and its salts may be similarly formulated with flavours.

The following Example will serve to illustrate this invention:

In 130 ccs of water are dissolved with heating 110 grams of starch hydrolysate which has less than 1% glucose, 115 grams of lactose, and 75 grams of sorbitol. The mixture is boiled until the temperature reaches 300° and 1.5 grams of hexamic acid are added with stirring. The mixture is poured into a marble slab and flavoured with one cc of U.S.P. Organge Oil, then hand folded, and when uniform cut into pieces. The taste was superior to a similar candy made using the equivalent amount of cyclamate salt instead of hexamic acid.

A five gram sample of the above candy was dissolved in water and titrated with sodium hydroxide to pH 8. A similar titration was made with the same weight of dissolved commercial candy. The latter required nearly five times the alkali to complete the titration.

I am aware of the Artificial Sweeteners in Food Regulations, 1969, and the Soft Drinks (Amendment) Regulations, 1969, and in so far as my invention relates to the manufacture for sale in the United Kingdom and/or sale in the United Kingdom of food products described herein, I make no claim to use the invention in contravention of the law.

WHAT I CLAIM IS:—

1. A non-buffered food product containing an acidulant in which said acidulant is betaine hydrochloride, hexamic acid, or acid saccharin.
2. The food product of claim 1 in which the acidulant is betaine hydrochloride.
3. The food product of claim 1 which is a solid food product.
4. The food product of claim 3 in which the solid food product is a confection.
5. The food product of claim 4 in which the confection is made from low-fermentable sugars.
6. The food product of claim 4 or 5 in which the solid food product is a confection and the acidulant is hexamic acid.
7. A food product as claimed in claim 1 substantially as described in the Example.

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